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ENGINEERING OPERATIONS COMMITTEE
MEETING MINUTES
August 4, 1994, 9:00 A.M.
EXECUTIVE CONFERENCE ROOM

Present:	R. A. Welke	C. J. Arnold	J. Kanillopoolos (B. Maki)
	G. D. Taylor	C. Roberts	J. K. Erickson - FHWA
	L. A. Kinney	L. R. Brown	D. Spangenberg (P. Miller)
	G. D. Dobie	J. D. O'Doherty	
Guests:	W. C. Turner	B. Nordlund	D. Croskey
	D. Coleman	E. Winkler	

OLD BUSINESS

1. Minutes of the July 7, 1994, meeting were approved as written.

2. **Report on "Evaluation of the Effect on Highway Traffic Noise Levels of Stone Mastic Asphalt Pavement" - R. Welke**

   The question regarding the beneficial aspects of Stone Mastic Asphalt Pavement (SMA) relative to ambient noise levels was posed by Mr. Chuck VanDeusen's letter of May 7, 1994. The committee's discussion, which centered around the response prepared by Leo E. DeFrain of the Materials and Technology Division, concludes that while comparing the noise level of new SMA pavement on M-52 with conventional asphalt -- "measured no difference in noise level."

   ACTION: R. Welke will prepare a response to Mr. VanDeusen conveying MDOT's experience and position regarding points raised in his letter of May 7, 1994.

3. **Scour Program and Procedures - C. Arnold/G. Croskey**

   In 1988, the Federal Highway Administration (FHWA) issued its first Technical Advisory T5140.20, "Scour of Bridges," and was subsequently updated on October 28, 1991. The advisory required each state to evaluate all existing water crossing structures for their susceptibility to scour. This was recognized by the FHWA as being a very time-consuming task. To complete this task, as an initial step, FHWA suggested that the structures be screened using data from the existing National Bridge Inventory System. Once the screening was completed, perform the scour evaluations based upon their degree of importance and the available resources. The screening has been completed and 1,454 state trunkline structures were identified for scour evaluation.

   In August of 1992, the FHWA established a target date of January 1997, for the completion of the scour evaluations for bridges categorized as 1) low risk, 2) scour susceptible, and 3) interstate bridges with unknown foundations. This basically means that all waterway crossing structures in the state, both state trunkline and local road agencies, will have a scour evaluation.

In January of 1992, MDOT formed an interdisciplinary AD HOC committee for the "Bridge Scour Program." The AD HOC committee members include representatives from Design, Materials & Technology, Engineering Services, Construction, Maintenance and FHWA.

The committee's charge was to:

1. Select existing bridges to be evaluated based on our initial screening.
2. Prepare a "plan of action" for bridges found to be scour critical.
3. Prioritize and evaluate the design and construction of scour countermeasures.
4. Oversee the training and instruction of bridge inspectors and departmental personnel on scour.
5. Develop procedures for inspection of scour critical bridges during and after large flood events.
6. Review and evaluate bridge inspection reports on reported potential or actual scour problems.
7. Review research on scour analysis and the design of scour countermeasures.

To proceed with the FHWA directive, the scour committee implemented a two-level scour evaluation process proposed by the Hydraulics/Hydrology Unit. The process is outlined in detail in the "Guidelines for Evaluation of Scour at Existing Structures" dated May 3, 1994.

The Level One analysis, completed in February 1994, for state trunklines found 656 scour susceptible structures requiring a Level Two analysis. There were 167 structures that required either further Level One review by Design Division or action by Maintenance Division. Of the 167, 77 structures required the following immediate actions. Seventeen structures were found to be scour critical. These structures were given the first priority for a Level Two analysis. Sixty structures are not scour critical. Maintenance Division will monitor 17 structures, and 43 structures required immediate scour countermeasure action (such as riprap). A list will be sent to each district by Maintenance Division.

Local agencies have been provided with the guidelines through the Engineering Services Division.

Upon completion of the evaluations, M●DOT will possess a database which will include key hydraulic and scour information about state trunkline structures over waterways. The information will provide a means to perform preliminary hydraulic review for initial scoping, cost estimating, etc.

Program costs, beginning in Fiscal Year 1991-92, were developed and funding levels for the Level Two review were outlined for completion in Fiscal Year 1996-97.

ACTION: The EOC approved the report as presented. The Design Division was assigned the responsibility to:

1. Address program needs within available staffing levels,

2. Coordinate with the Maintenance Division and districts, with specific attention given by the Maintenance Division to address the most serious problem locations.

4. **Proposed Widening of US-131 Around It's Interchange With the Proposed Southbelt (M-6) Freeway, South of the Grand Rapids Metropolitan Area in Kent County - P. Wisney**

This agenda item was tabled for a future meeting.

NEW BUSINESS

1. **Recommendation to Suspend the Use of Geogrids, Geofabrics and Membrane Materials for Pavement Rehabilitation or Maintenance (Attachment) - R. Welke/ E. Winkler**

The Bituminous Advisory Committee (BAC) reviewed data presented by the Pavement Performance Group of the Research Laboratory describing the performance of more than 15 projects where geofabrics, geogrids, or membranes were installed as an attempt to reduce reflective cracking. Analysis of this information demonstrated that such materials were not effective in reducing or preventing reflective cracking and tend to trap water within the cracks, thus promoting freeze-thaw deterioration.

The BAC recommends that the use of all forms of geofabrics, geogrids and membranes be discontinued for pavement surface maintenance activities and rehabilitation projects. In an effort to address the effectiveness of new materials or improved application technologies that alleviate reflective cracking, the committee recommends prior approval of any proposed trials by BAC. Criteria for consideration of any geofabric, geogrid or membrane will conclude as a minimum:

1. A thorough engineering analysis of the material and its application technology showing how the proposed material would affect the stress and strain values in the pavement to alleviate reflective cracking.
2. Cost effectiveness of the proposed treatment including the expected life of the fix with and without the proposed enhancing material.
3. Any proposed trial must include a plan for monitoring performance including a comparison with a control section.
4. There must be demonstrated significant differences between the proposed material and/or process and the products used in the past.
5. Trial installations would be limited in scope (5,000 to 10,000 syd) to keep costs within reason.

Use of geofabrics, geogrids or membrane materials for pavement rehabilitation or maintenance should no longer be permitted without prior approval of BAC.

ACTION: EOC approved the BAC recommendation as presented. As a follow-up to this action, R. Welke will arrange a summit meeting to discuss this issue with the construction industry during the month of September, 1994.

2. **Mobilization (Attachment) - R. Welke**

The mobilization was discussed in response to Mr. C. H. Van Deusen's request for consideration as part of the Pavement Selection Review Committee (PSRC) evaluation process in determining a project life-cycle cost.

ACTION: The EOC referred this issue, based on the committee's input and discussion, back to W.C. Turner for preparation of a response.

3. **Recommended Upgrade for Reflective Sheeting on Construction Zone Signs (Attachment) - J. Reincke/B. Nordlund**

Construction work zones have experienced higher accident rates than normal roadways. Factors identified as contributors to varying degrees include excess speed, distraction from construction activities and inadequate signs and barricades.

In an effort to address the potential for accidents in construction work zones, the M&T Division, in conjunction with the Reflective Materials Committee and the Construction Zone Advisory Committee, evaluated several types of retroreflective sheeting for construction signs. Based on the results of this research, M&T, on the behalf of the noted committees request approval of the following:

Recommendation that the department upgrade the reflective sheeting requirements from Type I (Engineer Grade) to Type IV or Type VII (Florescent Orange Prismatic).

ACTION: The EOC accepted the report presented and approved the recommendation in concept to upgrade as proposed with the following provisions for implementation:

1. Establish a committee with representation from districts, Construction, Maintenance, M&T, T&S, construction industry (MRBA) and County Road Association of Michigan (CRAM)
   - The charge of this committee will be to develop a strategy for implementation plan for final approval by the EOC on or before the scheduled January, 1995, meeting.
2. Upon completion of Item 1 above, present the implementation plan for final approval by the EOC on or before the scheduled January, 1995, meeting.

4. **Report on Recommended Method of Pavement Selection Life-Cycle Costing of Rehabilitated Pavements (Attachment) - R. Welke**

An interim report and procedures on Recommended Method of Pavement Selection Life-Cycle Costing of Rehabilitated Pavements was presented for approval.

ACTION: The EOC approved the report as presented and it will be submitted to the Transportation Commission for consideration/approval.

5. **Evaluation of Exhaust Gas Emissions and Worker Exposure from Asphalt-Rubber Binders in Hot Mix Asphalt Mixtures (Summary Attached) - D. Coleman/ J. Reincke**

The Michigan Department of Transportation (MDOT) developed and sponsored a project designed to evaluate the possible effects on the exhaust gas emission from the process stack and on the exposure of workers to asphalt fumes during lay-down and quality control work. Both the wet and dry processes that have been developed to incorporate rubber into asphalt paving materials were tested against three control mixes that did not contain any rubber. A total of seven mixes were tested.

The process stack emissions were evaluated for emissions of the following pollutants:

Criteria Pollutants: Carbon monoxide, total hydrocarbons, sulfur dioxide, oxides of nitrogen and particulate matter.

Hazardous Air Pollutants: Formaldehyde, acetone, benzene, toluene, ethyl-benzene, xylene, styrene, chlorobenzene, 1,3-butadiene, various polynuclear aromatic hydrocarbons, various nitrosamine compounds and various chlorobenzene compounds.

The final report is presently undergoing an extensive review process within MDOT as well as with the Environmental Protection Agency (EPA), Department of Natural Resources and FHWA.

ACTION: The EOC accepted the report as presented and request that an extensive internal review be conducted. Preliminary approval of the report. Upon completion of the MDOT internal reviews, an executive summary will be prepared for EOC review and final approval prior to disseminating the report to external agencies, i.e. DNR, FHWA.

6. **Report on Concrete Pavement Tour - W. Turner**

A team effort comprising representatives from the Design, Construction and Materials and Technology Divisions with members of the Michigan Concrete Pavement Association (MCPA) conducted a field tour of concrete pavement segments in various parts of the lower peninsula. This partnering effort is an attempt by MDOT to establish and maintain a dialogue with MCPA to discuss mutual concerns, and build concrete pavement that meet life-cycle (cost) expectations. A major item of discussion centered around the design of open-graded pavements that will give the stability that is compatible with subbase. The committee discussion revealed that there is a need for a process and recommended solution of interim solutions to address the problems with open-graded pavements.

ACTION: W. Turner was given the charge to chair a committee with Construction and M&T to address the problems with open-graded pavements. The committee will report progress of their activities at the monthly EOC meeting.

7. **Quality Control/Quality Assurance (QC/QA) - Revision of Specification Book - E. Winkler**

The Bituminous Asphalt Committee recommends that the requirement of QC/QA be included in the 1996 Specification Book. The QC/QA requirements will focus on acceptance procedures for bituminous mixtures.

ACTION: The EOC approved the BAC recommendations to include QC/QA requirements in the 1996 Specification Book.

(Signed copy on file at M&T)
Calvin Roberts, Secretary
Engineering Operations Committee

cc EOC Members
District Engineers

G. H. Grove	G. J. McCarthy	L. K. Heinig	T. Adams
E. D. Winkler	D. L. Coleman	W. C. Turner	D. L. Smiley
L. W. Martin	H. J. Nyquist	R. W. Muller	R. E. Nordlund
L. E. DeFrain	G. L. Mitchell	J. E. Norton	C. W. Whiteside
I. B. Patel	C. G. Cantrell	G. H. Gallup	A. G. Ostensen
G. J. Bukoski	R. D. Till	J. Becsey	